

Resource Community Formation & Change:
A Case Study of
WAITAKI PLAINS

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Working Paper 14

Taylor Baines & Associates

June 1998
ISSN 1176-3515

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INTRODUCTION

This paper reports the findings of a case study of the Waitaki Plains. It is one of a series of four case studies of agriculture communities in New Zealand. The case studies are part of an ongoing project entitled "Resource Community Formation and Change" that has been funded by the Foundation for Research, Science and Technology. The other case studies of agriculture communities in this series are Katikati (WP12), Clandeboye (WP13) and Otautau (WP15). Further case studies explore communities in the forestry and mining sectors.

A variety of research methods were used that focussed on the history of agriculture on the lower Waitaki Plains and the development of a dairying industry there following the establishment of an irrigation scheme. These methods included an analysis of census statistics, a review of published documents about farming on the plains and three days of interviews with both plains' families and members of business organisations and leaders in Oamaru and outlying communities. The field interviews were undertaken during early March 1998. Some further interviews were carried out by telephone.

Research community

The research community of the lower Waitaki Plains is bounded by the coast to the east, the Waitaki River in the north and SH83 in the south up to but not including Georgetown. The local communities are focussed around the two schools of Papakaio and Hilderthorpe. Of these Papakaio was the major primary school, Hilderthorpe was 'under threat' of amalgamation with the former. There was general consensus from both plains residents and outside observers that the Papakaio community was vibrant, the envy of neighbouring communities.

Previous studies of irrigation and farming on the lower Waitaki

In the late 1970's and into 1980 there were a number of studies that investigated the social and economic impact of the lower Waitaki irrigation scheme. These studies are an interesting historical record as the production base of the lower plains has responded in later years to a plentitude of water. The land use has diversified, subdivision and settlement patterns changed, the demographic patterns reversed and the production base of the Plains changed totally from dry land farming to dairying - the extent of change could not have been more dramatic. It is little more than a decade since dairy farming was introduced as a serious, irrigation based, land use option that is now cemented into the plains' economy.

AGRICULTURE AND WATER RESOURCES OF THE WAITAKI VALLEY

The Waitaki river

The Waitaki river, rising in the Southern Alps, is one of New Zealand's largest rivers and a major source of hydro electric power. The Waitaki power station was the last in the country to be constructed without modern machinery. Over half a million cubic metres of material was excavated by men using picks and shovels before construction of the dam could begin in 1928. Today the Waitaki Hydro

Group, built in the 1960's and 1970's, comprises twelve power stations. Sufficient electricity is generated from the river to meet nearly one-third of the national demand. The hydro lakes are also an important habitat for birds and wildlife, while camping, fishing, boating and swimming are popular recreational activities.

Farming in North Otago

North Otago has a long history of Maori and European settlement, but land settlement did not occur until the 1850's. At this time a number of extensive farming estates were developed on some of the best regional soils. At the turn of the century government policy determined that these large estates be 'broken up'. This was achieved by government acquisition, subdivision and on-selling by ballot. Closer settlement resulted. As a consequence many of the farms in this region of North Otago are today acknowledged to be too small for viable pastoral farming.

The downlands are predominately sheep farming with arable farming being located in some of the more fertile valleys. Those areas of lower soil fertility are used for extensive sheep and beef systems. The majority of the dairy herds are to be found on the irrigated, stony, lighter, Steward soils close to the Waitaki river. Prior to irrigation, two thirds of these lower Waitaki Plains were lucky to carry one sheep to the acre. Pasture was largely browntop, the farms were small. The largest holdings were between 300-400 ha's and a third of these farms were mixed cropping, sheep and cattle. It is debatable if these farms were viable without subsidies. The plains landscape was bare of trees.

The average rainfall ranges from 10 to 18 inches. Over the last 80 years in North Otago there have been twenty drought years recorded - a ratio of one drought year in every four. The late 1980's were exceptionally dry, with the drought peaking in 1988-9. As a result of these droughts North Otago received substantial financial inputs from central government. During the past decade this input has amounted to over thirty million dollars, the majority of which was drought assistance such as family income support, new start grants, farm consultancies and drought rehabilitation loans. The South Island East Coast received an estimated \$85 million in this assistance (Brown Copeland, 1991).

The Waitaki Plains Irrigation Scheme

The Waitaki Plains have a considerable history of irrigation from the Waitaki river. In 1906-08 there was a small Waitaki river irrigation scheme, the Stewards scheme, a stock water race with water use rights available from the Waitaki County Council. Originally commissioned through the public service, the Works Department, few knew how to operate it effectively. Nor was efficient irrigation technology available to realise the potential of the water. In time Stewards formed the basis of the County Rural Water Scheme (RWS).

During the 1930's Depression, work schemes instigated by the first Labour Government included irrigation projects. In the 1950's one of the country's first RWS's was established at Windsor, North Otago. These schemes had a great impact on their host communities. At last there was water for the stock, clean house water and water for recreation like the school swimming baths. Gillies (1980) argues that the emphasis on the impact of irrigation is usually 'macro', while the beneficiaries, the farm households, count the benefit as being 'micro', the new domestic water scheme that upgraded the quality and quantity of household water, for instance. The RWS's were constructed locally and so

provided local employment. But in spite of the RWS network, there was still too little accessible water during the region's drought summers. The drought appeared unbeatable.

By 1959 new technology advances in border dyke and spray irrigation prompted the North Otago Progress League to purchase a farm on the plains on which to develop a scheme capable of irrigating up to 300 acres. The water was taken from the Stewards scheme. There was doubt that such an experiment would be successful or that the scheme would withstand the withdrawal of consistent amounts of water. To the contrary the lesson learnt from the experiment was the capacity and potential for irrigation out of the Waitaki. While local farmers were impressed with the results none took up the challenge. Although some not on the RWS did apply to the County Council for water rights. Irrigation, it seemed, had been given a higher profile.

The 1960's saw a revival of interest in irrigation as central government initiated a number of regional schemes throughout the country. Both the Ministries of Works and Agriculture had now produced positive reports on the development of irrigation on the plains. At this stage water from the Steward Scheme could be supplied to some 6,000 acres. A number of progressive farmers, conscious that river water was "pouring out to sea" and aware that the land they were farming would be relatively inexpensive to irrigate, agitated for irrigation. In December 1969 the district voted acceptance of a scheme. Legislation then only required 60 per cent electoral support for an irrigation scheme - a major factor in the commencement of the Waitaki scheme.

The Ministry of Agriculture (MAF) were a major presence in the community throughout the 1960's, not only in support of the experimental irrigation farm, but also monitoring grass growth and demonstrating that stocking rates could be increased. As the irrigation debate grew they were instrumental in obtaining the government vote to proceed with a full-scale scheme.

The scheme was designed by the Ministry of Works to be completed in five years, and was commissioned in 1976. It was to cost 2.5 million dollars, funded over a ten year period. The actual cost grew to 8.5 million dollars and the scheme was not completed for almost 20 years. Farmers were favoured with a phase-in period of water charges, beginning in the first year of supply at one tenth of the charge and increasing by a tenth until the full amount had been reached. They were to pay the operational maintenance costs and the interest on the capital works. The contract required that water be delivered to the highest practical point on the farm. The on-farm costs were borne by the farmer but later on-farm work became capital work and could be charged against the scheme. The increase in capital costs and the costs incurred in the delayed completion meant the interest bill was considerable. However a clause in the contract excused farmers from paying the full cost until the scheme was ten years into total operation. A unique aspect of the scheme was its fast development. Farmers had an even flow of on-farm water within the first years of development, coming onto the scheme as soon as water reached them.

Within a decade the scheme was facing a "*massive loss*". The immediate response of the Ministry of Works was to increase the water charge up to \$50 ha, later \$80 ha. The cost of water became prohibitive. By the early 1980's the price of lambs had dropped and agricultural subsidies had been withdrawn. Farmers were not in a position to service the interest debt and pay higher water charges. Irrigation at this price was uneconomic for financially vulnerable sheep farm operations.

The Government of the mid 1980's appreciated the problem; there were some 48 similar schemes throughout New Zealand and they were all in varying degrees of financial strife. These schemes were eventually offered to farming communities in the hope of recouping the capital debt. On the plains a

Farmers' Liaison Committee was set up to review the option of purchase and to negotiate a price. It was agreed by Treasury that the purchase criteria would be based on sheep farm production, with an acknowledgment that the sheep industry was depressed, although there were already some dairy units on the plains. Purchase was made by the community during 1989/90 for less than one million dollars. Farmer leaders today comment that while the sale may have cost the nation nine million dollars the difference was soon recouped in increased production.

Borrowing the purchase price, the Lower Waitaki Irrigation Company was formed. Shareholders were participating farmers, the Pukeuri Freezing Works and Oamaru, through the Waitaki District Council. Share allotment to farmers was based on one share for every acre of land accessible to irrigation. The shares remain with the land and are automatically transferred on sale of the farm. The freezing industry and the town were assessed on the amount of water each used. The Scheme's debt was repaid in the first three years of company operation and water rates have been reduced and now contain rebate clauses. The Company introduced a flat instalment water rate as they stabilised operating costs erasing high cost fluctuations at times of drought and low farm incomes. While there are currently some 170 farms on the scheme a further 20 per cent of the plains could successfully sustain border dyke irrigation.

The farming system has been irrevocably changed. Just how irrevocably is encapsulated in this comment, "Ten years ago there were 30,000 sheep on the plains today there are 30,000 cows".

DEMOGRAPHIC FEATURES

Population profile

Population¹ changes from 1986-1996 are shown in Table 1. Despite local perception that the population base has "exploded", through diversified land use patterns and the commercial and employment opportunities offered by irrigation, there is in fact a more modest growth. This growth is nonetheless significant, when compared to the fall in population in surrounding rural areas and down land communities such as Ngapara.

Table 1: Waitaki Plains - Population changes 1986-1996

Census Year	Waitaki Plains		New Zealand	
	No. of Persons	% Change in Pop.	No. of Persons	% Change in Pop.
1986	636	-	3,263,283	3.8
1991	666	4.7	3,373,929	3.4
1996	699	5.0	3,618,302	7.2

However, the plains population continues to be transient. There is a common turn-over of sharemilking families coming in, gaining experience and moving out and upwards on their individual dairy career paths. Sharemilkers work on three year renewable contracts and so stay in the community for either

¹ The profile for the "Waitaki Plains" area has been compiled from Supermap 3. Data for the Plains area have been obtained from mesh block numbers 2826900, 2827000, 2827100, 2827201, 2827300, 2827600 and 2827700.

three or no longer than six years. Dairy workers, employed by the sharemilkers, often stay no longer than 12 months.

The population of the service town of Oamaru declined from 13,969 in 1986 to 13,417 in 1996. The population of the Waitaki District as a whole has been in decline since 1951 (Fitzgerald and Taylor, 1989).

There were no data available at the mesh block level in Supermap 3 to allow compilation of the age-sex structure for Waitaki Plains. The age structure of Waitaki district as a whole shows more than the national average in the 65 years plus age group of 17.0 per cent. This difference is influenced by the population of Oamaru, because for the Statistical Unit of Maheno, the rural district in which the Plains lie, the figure is only 8.8 per cent. There are no other strong differences evident.

Social and farming systems change with the advent of irrigation

Changes in land use and farming systems were inseparable from the changes in the demographic structure of the plains. By the early 1970's, lead by the impact of irrigation, there was a major social change on the Waitaki Plains. Change that was represented by altered patterns of farm ownership, sometimes within households, but more importantly incorporating outside families.

There were two waves. In the first, farming systems on stony Steward soils changed as established dry land sheep farming families on the plains sold their farms and were replaced by younger families generally from the North Otago down lands (Houghton, 1980 p.55). They were eager to modify traditional farming systems supported by an accessible and regular supply of water. Up to 70 per cent of the existing farmers moved out. Houghton and respondents described the hesitant reaction of the existing farmers to irrigation, which was viewed as harder than dryland farming. The exodus from generational farms reflected this reticence towards irrigation. These farmers were frequently former Returned Servicemen who did not want to face another round of development and new debt. With the completion of the scheme competition developed amongst plains farmers to diversify but only a few of those who had been left after the successive droughts were progressive thinkers. Few of these farmers could aim for maximum production, they were dry land farmers who hadn't progressed with time - they had in fact been too busy defending their farms against debilitating drought. Irrigation farming was a "*younger persons game*". The first generation of younger, irrigation farmers were another wave of "*farming pioneers*".

They set about improving pasture for cropping and sheep farming and then built bigger and better homes and farm buildings. The immediate farming impact was an increase in stock numbers. One farmer recalled that he had carried 600 stock units. With irrigation he was carrying 7,000 stock units. Another noted that before irrigation the farm he purchased carried 800 "*starved ewes*", after irrigation it carried 8,000 "*in good condition*". For the first time farmers were presented with a range of options, two being cattle and a diversity of cropping. After a time, however, it became obvious that sheep "*went back*", or lost condition, despite the irrigation. Gestation was out of kilter with the irrigation season. Lambs were always "*too late*" and never of an age to maximise the best feed conditions. As well they contracted diseases resulting from the lush pastures. Cows became appreciated as the natural animal for this type of irrigated land.

In 1978 there were two dairy units on the plains. Then the first wave of irrigation farmers were replaced by other families from outside the region who replaced the existing production systems with

the new land use of dairying. The farmers they bought from didn't want to dairy farm. The increased land value they had achieved through irrigation released some of them in a positive financial position. For others it was the very opposite and they never recouped their investment. In 1979, O'Neill described a local sheep farmer acknowledging that after irrigating 370 of his 496 acres for two years and having trebled his stock numbers, his financial position remained depressed. The development of irrigation on this farm had cost \$72,000. Since purchase in 1961 the value of the property had risen eight fold but escalating costs and reducing returns from meat and wool production did not justify the irrigation investment. Many plains farmers went into 'massive' debt to ensure irrigation.

Earlier the Rural Bank had looked favourably on irrigated farms, encouraging borrowing. While they came to appreciate that sheep and cattle did not prosper with irrigation, the Bank saw Southland as the dairy region and were less inclined to look favourably on aspiring sheep turned dairy farmers. Those who stayed and moved into dairying in the 1980's did so as a result of the removal of subsidies on sheep production, the rise in interest rates, high inflation and uncertain and depressed sheep and bull beef markets. It was the time of forced farm sales, a vulnerable time for pastoral farming. These farmers had invested heavily to develop their farms to maximise water use and they were caught by the downturn. They had two options, to move out or stay and bite the dairy bullet and the considerable cost of conversion - at least one farm in the present study had cost one million dollars to convert from a sheep to a dairy farm.

The incoming dairy families were not local but from the North Island. At the same time a number of Dutch dairy farmers arrived on the plains. This was the first wave of real dairy operators into the Waitaki; only now did the plains become a true dairying district. With immediate results, for these farmers applied North Island dairy management practices and goals. At this time Temuka Dairy, later the Alpine Dairy Company, offered a bonus premium per kilo of milk fat over the normal pay out. While the premium reduced over four years it was an attractive incentive as farmers entered the district and began to set up their dairy units. Very soon the plains were producing as well or better than the best in the North Island. The district went from pastoral to dairying in near record time.

By 1980, the year of Houghton's work, the demographic trend was already emerging. Then, few families were born outside the district. Today few of these 'old' families are left on the Plains. The few original families who are still farming the plains changed their farm systems in response to irrigation. In many instances these changes were a series of production based diversification over a period of time until the 'right' production mix was reached. For instance, they went from cropping and sheep then to bull beef and cropping, then all bull beef and finally into dairying. It is probable the first pastoral farmers viewed irrigation as an 'insurance' against drought years rather than the means of underpinning their entire production base. Rowe (1982) argued that the establishment of "irrigation may increase production but the objective of having irrigation is seen more in terms of a form of insurance than as a means of maximising the gross returns from the land area". Certainly the dairy farmers who eventually established on the plains viewed irrigation as a daily tool with which to pursue their trade. It was an essential resource as necessary as sunlight and grass, so necessary that should their operation be deprived of continual water they would face both production and financial collapse.

INDUSTRY, WORK AND OCCUPATIONS

The role of the state

The state had the major role in development of hydroelectricity on the Waitaki River. It then had a major role in the introduction of irrigation to the lower Waitaki Plains. That role included the Parliament as the decision making body on new schemes, the Treasury as the funding controller, and the Ministries of Works and Development and Agriculture as designers and leaders in the hands-on development of the scheme.

In the late 1980's the Government provided substantial assistance to farm families in the form of drought relief. There was income support and also assistance with restructuring of farm debt, including an "exit" package (Fitzgerald and Taylor, 1989 p.12; Brown Copeland, 1991).

Division of labour within the industry

It was in the late 1980's that the dairy corporates Tasman Agriculture and Applefields appeared in the dairy industry. North Otago was one of their early 'buy ups' of dairy properties. Initially their appearance was not welcomed because of their methods of farm acquisition. They were seen to be at a financial advantage in the market place. For some farmers it was a relief to sell their farms but what was not welcomed was the loss of family identity and local ownership. There still remains some bitterness regarding the manner in which the corporates obtained their land. They bought at the 'down turn' when farmers were at their most vulnerable and they are still described by some as "*corporate raiders*".

The long term advantage of corporate dairy farming in the community is that it resulted in a more stable turnover of farms. Corporate sharemilkers tended to be contracted for longer than the usual three year period. Sharemilking life on a corporate farm was described as "*like being on your own farm*" with the exception of the pattern of the three monthly visits by representatives of the company. There was some resentment in the community that the corporate workers, and some times the sharemilkers, had little respect for the community assets worked for and funded by the district. That they were seen as "takers" not "givers", but it was also acknowledged that short-term employment contracts found common to the industry did not encourage a community commitment.

Restructuring of the 1980's

The 1980's saw considerable restructuring of the agricultural sector with the withdrawal of farm subsidies. There were many associated changes, including restructuring in stock and station, transport, communications, banking and other sectors, all affecting farming (see the Agriculture Sector Review, Working Paper 4 for details). Most important was the phasing out of subsidised credit to farmers through the Rural Bank, although this was not before the bank was used as a primary instrument in restructuring the finances on many farms.

The Rural Trust, working with creditors, assisted 342 farmers in North Otago, including 76 New Start Grants. Very few (4) assisted exits were irrigated properties, and these tended to go to dairying. Others changed hands into dairying outside the Trust activities (Taylor, 1990).

Technology and the organisation of work

Irrigation is a major technological change for dryland farms. It was described as an “*exciting anti-depressant*”! Irrigation is now the life line and water the livelihood of plains farmers. It gives them product options, freeing them from a restrictive climate, allowing them to strive for product excellence and encouraging more comprehensive market decisions. The more intensively cropped farms had invested capital to reinforce the cost of irrigation and ensure their ability to add value to their produce. Stock breeds changed and new management techniques were required from farmers. Following the 1976 drought the option was to either move off the farm or accept irrigation, and with irrigation the pressure to develop.

Changes in technology and the organisation of work are embedded in the differences between very different farming systems. The community was slow to appreciate that dairying was inherently different from the farming system with which they were familiar. For instance, all dairy production goes to one point. The industry provides the transport of farm product. With the exception of fertiliser, the extent of inputs is considerably less than in the other farming systems. Few outside contractors are used, and the type of contract work changed from heading and harvesting to silage and hay making. The on-farm work routine was totally different from either pastoral or arable routines.

The plains soil is lacking minerals, being selenium deficient, which is not good for calf mothering. But dairy farmers are reputed to be “*great feeders of the land*” and on arrival they set about building up the plains' soil. The district is described as “*easy*” dairy country, with a favourable climate but the key is water. Both the soil types and the availability of water mean that intensive farming has a place in regions like the Waitaki Plains. While there are large tracts of stony Steward soils on the plains that with accessible water are suitable for dairying, there are also large areas of Waimakariri and Pukeuri silt and loam soils suitable for vegetable growing and cropping. In the past two years many of these good soils cropping farms have been sold and converted to dairying.

While the most obvious land use change has been from pastoral to dairying another change has been taking place that is easy to overlook. Today there are but ten cropping farms on the plains when a decade earlier there were twice that number. The missing cropping operations have been converted into dairy units or dairy grazing blocks. Irrigation has had an impact on cropping. Seed companies look to seed suppliers with irrigation and when there is a limited supply of production seed irrigated farms get preference. Irrigation allows a quicker response in production supply and type to market demands, and with irrigation the risks are spread more widely. Nevertheless the irrigation costs must be affordable to the enterprise.

For cropping farmers irrigation means specific management keyed into the seasons and type of crop. Irrigation means work, some of it frustrating and all of it repetitive. Irrigators cannot be neglected, moving and setting up must be done daily, often twice daily. The work is time consuming and leads to long hours shifting equipment early in the morning and late at night seven days a week from August to April. Irrigation dominates social life. The early morning, late night routine is deliberate in any country open to strong winds. High winds can overturn an irrigator and the gun type cannot be used at all in a high wind.

Occupations and class structure

Agriculture is, decidedly, the main source of employment on the Plains (Table 2).

Table 2: Sectoral distribution of the workforce of Waitaki Plains - 1996

Sector	% of workforce	
	Waitaki Plains	New Zealand
Agriculture	60.6	9.2
Mining/quarrying	-	0.3
Manufacturing	9.9	14.3
Electricity/gas/water	-	0.6
Construction	1.5	5.8
Wholesale/retail	7.6	22.3
Transport/communications	1.5	5.3
Business/financial	3.0	13.1
Community/social	12.9	23.0
Total Number of Persons	396	1,630,812

The dairy industry is the major agricultural employer. And while at least two other industries, horticulture and forestry (nursery), employ significant numbers peak employment in these industries tends to be seasonal.

The great majority of the workforce are agricultural workers or trades people (Table 3).

Table 3: Occupational status of the workforce of Waitaki Plains - 1996

Occupational category	% of workforce	
	Waitaki Plains	New Zealand
administrators/managers	5.1	11.6
professionals & technicians	8.7	22.6
clerks	5.1	13.3
service/sales	6.5	13.9
agriculture & fisheries workers	55.8	9.4
trades workers/machine operators/ elementary occupations	15.9	24.3
Total Number of Persons	414	1,630,812

The participation rate of the workforce in 1996 (75% cf. 59% for NZ) was high, unemployment very low, and self employment high, as expected of a farming area (Table 4).

Table 4: *Employment status, Waitaki Plains - 1996*

Area Unit	Wages or Salary %	Self-Employed & Employer of others %	Unemployed %	Full-time %	Part-time %
Waitaki Plains	42.7	26.4	1.1	60.1	15.2
New Zealand (TLA)	43.5	11.0	4.9	45.0	13.6

Yet the establishment of dairying on the plains resulted in an increase in farm workers. Previously the sheep farms had been ‘one person’ units. By comparison dairy farms require workers at a ratio of one to every 100 cows. The structure of the dairy industry is based on the working partnership of the farm couple so entire families moved into the district. Many sharemilkers see sharemilking as a career in itself and have no ambition to own a farm. Nevertheless the career path in sharemilking is clearly defined and based on the ratio of ownership between the milkers and the dairy farmer. Many plains dairy landowners still live on their farms and work with their sharemilkers, which is not as in other dairy districts where many owners are absentee owners.

The dairy industry requires responsible and mature labour. While many of the employers interviewed felt that generally young people today were “*not interested in working*” it was recognised that dairy farming could have a tarnished image with its long hours of work, sometimes poor pay and poor living conditions. The work routine of six days on and two days off was not seen to encourage career motivated young people. At least one sharemilking family employ single workers from disadvantaged or long term unemployed backgrounds under a government work incentive scheme. They aimed to give the worker a “*work ethic and a future*”. Employment within the industry was often by word of mouth.

Some sheep farmers or dairy farmers who were formerly sheep farmers were criticised by their peers for not having “*employer skills*”. By paying poorly and providing poor living conditions these farmers did not retain good employees, opening the community to “*undesirable*” workers, who many believed were responsible for a growing petty crime rate where once there was none.

REGIONAL AND LOCAL ECONOMY

Oamaru

Oamaru is the commercial and administrative centre of North Otago. It has a strong association with the early development of agriculture in the South Island and by 1878 was the country’s ninth largest town. The discovery of an excellent building material, limestone, contributed to the town’s appearance of permanence and stability. Architects and stonemasons revelled in classic forms of architecture. As a consequence Oamaru has some of the finest streetscapes in New Zealand, the focus of a growing tourist industry. An industry that has recently diversified into eco-tourism with public viewing of the blue penguin colony. Oamaru hosts the headquarters of the Waitaki District Council. Historically the town earned a reputation for excellence in the provision of education. A diverse selection of schools, state, boarding, private and church still exist. A small fishing fleet works out of the Oamaru Port.

Oamaru, the Waitaki and the development of irrigation

The traditionalists in the community were reluctant to appreciate the potential of irrigation and dairying to the plains. The Oamaru commercial sector also appeared slow to realise the plain's potential for business. One major stock and station agency with strong links into the North Island dairying industry withdrew from the region just as the dairying potential was realised. Irrigation service industries are found outside the region in Timaru and Ashburton.

Oamaru seems strangely apart from the vigour and industry apparent on the Plains. Commentators noted that the town had a skewed population with "*lots under twenty*" and "*lots over 60*". It was suggested that the young and "*people of high calibre*" left Oamaru not to return and that as a rural town Oamaru fails to meet expectations because it was "*not quite big enough*". But although commentators noted that negativity and apathy were apparent in Oamaru they also identified a "*driving force*" of leaders in the town who were responsible for developing the blue penguin tourism project, the excellent eating places and the old town shops and small businesses, all of which have become tourist attractions. It was felt that many residents were unaware of the variety of entrepreneurial activities based in Oamaru, like the small factory that manufactures a special digital scales electronic component for international export. Several suggested that without the plains irrigation Oamaru would have been in "*real trouble*". They pointed to the economic multiplier effect profiting the Oamaru building industry with the upsurge of conversion work. Farmers, it was pointed out, must also spend on seed, fuel and technical services.

The burgeoning dairy conversions required increased fertiliser use, re-fencing, new pipes and troughs, pipe fittings and irrigation systems, earthworks/border dyking, milking sheds, and new house/extra accommodation. But technical irrigation services were established outside the region, namely mid and south Canterbury, prior to the conversion of the plains to dairying. Therefore plains farmers look north for these services. If they travel north they also buy other provisions and undertaken other commercial activities in the towns providing these technical services. Oamaru therefore by not being the major supplier of technical services also misses out on other commercial activities. For Oamaru the situation is not likely to change unless irrigation is taken to valleys like the Kakanui. These farmers would expect to find their technical services in their local town. Cropping farmers also reported that machinery spare parts were not kept in Oamaru so for replacements they must shop out of the region.

The economic impact of the lower Waitaki irrigation scheme benefited commercial operations already in existence. The dykes were built by a mid-Canterbury firm of civil engineering contractors; a transport company moved down from South Canterbury to Oamaru to take advantage of increased cartage opportunities; building and construction was contracted locally; and the spray line tender was shared by two Christchurch firms; and smaller firms in Oamaru, Ashburton and Waimate shared sub contracts. A beneficiary of the completed scheme was the Waitaki Electric Power Board as extended power lines were essential.

As the production base of farms was changed to dairying, major building programmes were initiated. Yards and single mens quarters had to be built, cow lanes formed, milking sheds erected, and frequently a second house had to be built for the sharemilking family. Contractors also had to be employed to build the on-farm irrigation system. Local firms were hired, becoming major economic beneficiaries in the dairy conversion of the plains.

Prior to the advent of irrigation there was one veterinary surgeon to service the region, today there are eight. One vet offers a combined animal health clinic and retail outlet for animal service supplies. A

veterinary retail outlet was seen by him as being inevitable once the last stock and station agency withdrew from the town. In the vacuum created by this exodus the veterinary practice has taken over a role previously undertaken by the stock firms. On arrival in Oamaru this vet found that “*no-one was prepared to tackle the dairy industry*” so he developed his practice on a “*One-Stop-Shop*” basis.

Smaller local mercantile firms, based in Oamaru, were also established by energetic entrepreneurs to fill the gap left when the stock firms withdrew. They are founded upon personal knowledge of the area and long term experience in agriculture. Frequently their personnel were employees of the former stock firms. They are the antipathy of the large nationwide chain agencies that served the region in the past where “*farm programmes were designed by head office*”. These local firms recognise the importance of interdependence between their services and their clients needs as they formulate relevant and viable farm management and financial strategies. They are not restricted by regional boundaries and trade into mid-Canterbury.

The regional and national economic impacts of agriculture

Morton (1978) notes the power of irrigation to transform the countryside, turning drab land into ‘verdant colour’ and replacing barrenness with production. Irrefutably irrigation brought production to the plains and it also brought trees. Prior to irrigation the plains were described as being “*a desert*”. Recollections of a treeless plains included stories of watering individual saplings with buckets and planting at least three before one survived to maturity. Today the plains are thickly planted and farms boast vegetable and flower gardens all as a result of irrigation.

Irrigation and dairying have provided a “*platform for spin-offs*”, economic multipliers into the regional farming industry and beyond. Brown and Hubbard (1980) investigated the regional impacts of the development of irrigation on the lower Waitaki district over a seven year period from 1970-1 to 1977-8. They found that the development of the scheme injected money into the regional economy from three primary sources i) construction (irrigation) expenditures on and off farm ii) operation and maintenance expenditure iii) increased production. Today, with the consolidation of dairying on the plains they could also add construction of farm buildings and milking sheds, houses and accommodation and other conversion costs like re-fencing. Brown and Hubbard show considerable economic benefits injected into the region, directly and indirectly. The impact of this multiplier effect is wide and should not be sought only in visible and direct transactions.

The economic benefits of the dairy industry fall outside regional boundaries as much as they do inside. The dollar impact of the number of cows grown on the plains has been considerable. One cow brings in one thousand dollars, half of which goes in operational costs including contractual expenses, while a third goes in tax. Central government has benefited from the increase in farm profit contributing to a higher tax take out of the plains. It has also benefited by gains in the export market through increased production. That the flow-on effect can be local, regional or indeed national can cause confusion in the mind of the local community, where the multiplier effects may not be so visible. Indirect local benefits are reflected in the rise of the school roll and increase in the number of employed teachers (some of whom are employed off farms) or in the increase in business generally.

The income of an irrigated cropping farm was three times what it had been as a dryland farm. As a dairy farm it would be six times greater. A cropping farmer’s expenditure was 50 per cent of gross, a dairy farmer would spend twice the cropper’s expenditure and three times what a dryland farmer spent. This is an important consideration in terms of economic benefit and impact.

Furthermore, personal and household incomes are high on the plains (Table 5) with implications for personal spending.

Table 5: *Distribution of Household Incomes of Waitaki Plains - 1996*

Household income range	% of households	
	Waitaki Plains	New Zealand
Less than \$10,000	1.2	5.4
\$10,000 - \$30,000	31.3	31.0
\$30,000 & over	53.0	46.5

The change in production base to dairying meant that production no longer had value added locally. Previously sheep and beef meat went to the nearby Pukeuri Freezing works. Milk goes primarily to the Alpine Dairy plant at Clandeboye, South Canterbury (see Working Paper 13) and is processed into a number of products. Furthermore, at least one of the dairy corporates tenders nationwide for such inputs as fertiliser and chemicals. Crop seed on the other hand is bought locally from Combined Rural Traders (CRT), Oamaru. The district has an interdependent market network centred on dairy operations. Cropping farmers sell feed to dairy operations, an pastoral farmers lease their land for wintering-over arrangements. Dairy farming has therefore generated internal markets within the plains. Hill country and dryland farmers have benefited from ‘wintering over’, grazing contracts. The dairy farmer expected value for money, but the dry land farmer had no experience in winter grazing of dairy cows. He may have experienced winter grazing beef cows, but the requirements for dairy cows were quite different. While some quickly learnt good grazing techniques others did not. Friction arose when cows lost condition. There was also the question of pasture reliability. North Otago has a dry, summer drought climate when pasture dries out. Some dryland farmers made no provision for this affected winter pastures. Increasingly, dairy farmers grew unwilling to risk either the climate or poor management techniques by grazing their cows ‘away’.

A trend emerging is that some dairy farmers retaining control of wintering over by winter grazing their own stock. Established dairy units now have available capital to extend their operations by leasing or buying additional blocks of land. An unexpected result of on-farm wintering over has been the fragmentation of land as these blocks are bought up. This is not a question of land amalgamation as the blocks are frequently some distance from the home farm. However the present concern of dairy farmers is that there is not sufficient land available for dry blocks and wintering over and that they remain “*exposed*” to contracting this grazing to dryland farmers.

Strengthening the economic base of the Waitaki

Members of neighbouring communities like Waiareka and Kakanui, having observed the development on the plains, are determined to bring irrigation to their district. Gillies (1980) compared the Waitaki Plains with the Kakanui downlands. Even by 1980 the plains were outstripping the dry downland farming communities in all aspects of development although dairying had not yet become the predominant land use. These inland valleys have greater production potential than the plains because the soil, a good loess blown over from the plains, ironically, is more fertile. There are already individual valley farmers who have lead by example and established on-farm bore irrigation systems that have transformed their farming systems. The present dilemma is how to efficiently and cost effectively transport the water from the Waitaki river into the dryland valleys.

Horticultural development has potential and expanded irrigation led to a berry farm increasing to ten acres. The enterprise creates between 70 and 80 jobs during the season. The berries are marketed south as far as Invercargill and north to Christchurch. The Christchurch market is both domestic and international. The major problem for this enterprise is reliable labour during the picking season. In the past there were several berry farms in the district, today only two remain. The demands of labour and the opportunity to sell land well during the period of dairy conversion hastened the demise of the other enterprises.

Cropping farmers were large contract growers of freezer peas, currently a depressed market. But a new local market has risen with the popularity of the feed crop, maize. Long grown in the North Island for cow fodder, it is now being grown successfully in the district. Cropping farmers grow maize on the land left empty by the failed freezer pea market.

A major forestry enterprise (one of two) located on the plains from North Otago for two reasons, the centrality to markets and the availability of water. While one aspect of the enterprise, bare root tree production, could survive without irrigation the other, raising container tree seedlings, could not. The enterprise covers 170 acres of land and during the 1997 winter produced 4.5 million bare root plants and 11 million container seedlings. It has a spray system using aquifer well water because of its purity. The nursery employs 12 full time staff with a total of 60 during the winter. Staff numbers will increase as the business continues to grow. The nursery glasshouses were manufactured in Christchurch, the irrigators (following a Swedish design) and metal tables were made in Oamaru. Earthworks and other metal equipment were made by Christchurch firms.

The influence of the Otago Development Board in rural North Otago was reported as not being great. The imbalance of population between north and south Otago resulted in more southern fund applications. Initially the Board funded a pre-feasibility study of the Waiareka/Kakanui valley irrigation scheme but funding to carry out the actual feasibility study was not forthcoming from the Board.

PHYSICAL AND SOCIAL INFRASTRUCTURE

Infrastructure

The key infrastructure for recent development of the plains was the community irrigation scheme. But there is other essential, public infrastructure, particularly excellent transport systems and networks on a largely flat topography. The plains are transected by both state highway 1 and the main trunk railway.

There is also close access to major freezing works and dairy processing plants. Other, private infrastructure, critical to the development of the new dairying industry, appeared slow to evolve, as described above.

Housing

Housing is largely private and is an important component of employment in the dairy industry. A number of houses are provided rent free to workers and young couples (Table 6).

Table 6: Tenure of Dwellings in Waitaki Plains - 1996

Form of Tenure	% of dwellings	
	Waitaki Plains	New Zealand
Provided rent free	19.0	3.7
Rented	12.6	22.9
Owned with a mortgage	30.5	35.2
Owned without a mortgage	29.5	31.1
Total Number of Dwellings	285	1,276,332

Health and social welfare organisations

Health and social welfare services generally are provided out of Oamaru, with some services also provided out of Timaru, as a result of the centralisation of government administration.

Education

Morton (1978:29) explains the increase in school rolls resulting from ageing farmers in the irrigation district selling out to younger farmers. There are three schools facing closure in the wider district that rely on a farming catchment that is not dairy based.

In contrast, the dramatic rise in the number of young people of the Waitaki Plains impacted positively on the local school. The roll increased and the number of teacher placements went from one to four full time, two part time and one part time school secretary. But an interesting phenomena exists. Sharemilkers come into the community when their children are between two and three years old and they leave when their children are nine and 11 years old. This results in school rolls being 'bottom heavy', with large junior classes. While some families are transient and pupils turnover, the children still make and maintain friendships.

The stronger the educational base becomes the more it acts as a magnetic attracting children from less well endowed schools. There was evidence that this was already happening. Parents from outside the community who placed their children at Papakaio were "*concerned for the education of our children*". Their action was resented by their own community. It becomes a double edged sword for parents who wish to remain active and committed members of their own communities and seek "*a vigorous and well appointed school*" for their children.

Training

MAF was a major presence on the plains throughout the commissioning of the irrigation scheme. They adopted responsibility for a series of discussion groups that taught farmers how best to use the new resource, water, and how the irrigated soil and the water should be managed. They showed what cash crops could be grown and what grass mixes were best. It was MAF who through their discussion groups opened the sheep and beef mentality to other options. When pastoral farmers switch to dairying

they upskill themselves by reading industry information, visiting established dairy units, frequently in the North Island, and learning from their sharemilkers.

Sharemilkers switching from agriculture to dairying take agricultural extension or business management courses from any of several polytechs offering distance learning. Informal training is obtained from experienced herd managers and attendance at field days. The industry is eager to share knowledge, and information and back up support of both an informal and formal nature. Dairy companies all have visiting liaison officers. In 1997 the industry ran an educational and promotional programme into secondary schools.

Research

Current international research focuses on extraction of proteins from milk. The value of this type of protein is that it is not sourced from red meat. Comments were made that dairy production must continue to improve so that it is to the high standard that diversification of its products will require

RESOURCE AND ECONOMIC PLANNING AND LOCAL GOVERNMENT

Local and regional government

There is longstanding precedent for several tiers of local and regional government in the Waitaki Valley. The Waitaki Catchment Commission was established in 1947 and overlapped with the Waitaki, Waimate and Mackenzie Counties. It was eventually superseded by the South Canterbury, then Canterbury, Regional Councils. Pest boards were also incorporated into the new Regional Council. But under local government reform in 1989 the Waitaki Plains remained part of the Waitaki District Council based in, and incorporating, Oamaru. The regional boundary remains a contentious issue south of the River.

Local government has had a role in the provision of water to the plains since the 1950's through the Rural Water Scheme. The role continues today as the District Council has representation on the Board of the Lower Waitaki Irrigation Company.

Both local and regional government have been beneficiaries of the positive consequences of production increases on the plains. Local government through the escalation of land values, currently at \$1,300 per ha, and the subsequent increase in the rate take. One example of the climb in land values was the farm purchased in 1972, prior to irrigation, at one hundred dollar per acre, sold in 1982 for one thousand dollars. The market price today, 1998, was three thousand dollars per ha. While some of the dollar difference can be accounted to general land inflation the value that has been added to these plains farms should not be discounted. Through the rating system the general beneficiaries have become the wider community.

The Waitaki District Council is supporting the feasibility study investigating the proposal to carry water from the Waitaki into the Waiareka/Kakanui valleys. The Council will only support the project if it is shown that the water will benefit the whole community, not just one sector or individual. The Council believes that future development of any irrigation scheme must be based on partnership representing all the beneficiaries.

Resource and economic planning

The Resource Management Act (RMA) will have considerable influence on the future use of water and it was suggested that establishing a new scheme today will be more difficult than when the plains scheme was designed. The Act is seen to have a greater influence than agricultural goals or production diversification. Many believe that the consent process will “kill” any scheme to extend irrigation from the Waitaki into neighbouring dry land valleys. They consider that had the RMA existed in 1970 there would be no irrigation scheme on the Waitaki Plains. The scheme would have failed just on the extent of terracing that was cut out for in fill, and on the water use conflicts between irrigation, recreation and hydro power generation.

Apart from the RMA, the restriction to development from the economics of production vis a vis the costs of production and continued availability of markets is probably stronger today without the buffer of a scheme funded and built by central government.

A respondent commented: “*The country will not progress without water. Internationally deserts have flowered, we should use our water resource to ensure our export production expands*”. The link between the water resource and export production was the reason given why governments should support irrigation schemes, for the betterment of the whole country through expanded export markets. The future of irrigation probably lies elsewhere, other than the plains: a dam on the Kakanui or carrying water to that inland valley from the Waitaki. While there is no technical reason why excess Waitaki water could not be carried into the dry downland district of Waiareka-Kakanui the exercise must come at a cost affordable by the community.

Water would have a similar scale of economic and social impact in the Kakanui as it has had on the Waitaki Plains. The first generation of irrigation farmers there would most likely sell up, as happened on the plains, because of their reluctance to manage the water. The plains proved that it is not sufficient just to have irrigation, the problems don’t end there. The plains experience of the 1980's when farmers were encouraged to borrow heavily, then interest rates escalated could well revisit the valleys. Any new scheme would need to negotiate a realistic price and maintain realistic costs and would be likely to seek government support.

COMMUNITY

Community activities, organisation and leadership

Morton (1978) argues that “water can transmute a society as definitely and profoundly as it transforms the landscape.” He found that in local Canadian and Australian towns irrigation always had “an increase in the servicing sector, increased school rolls and improved leisure facilities, such as sports clubs”.

With the influx of dairy farming families on the plains social contact was strained. There was a lack of understanding by the existing community of the work routines of the dairy industry, that this was “*a new ball game*”. Non-dairy families had to quickly learn when the busy or peak dairy farming times occurred. The timing of the annual school picnic was only altered after the community convinced the principal that population and production change went in tandem with social change. Initially when welcoming functions were organised, either nobody came because it was a peak time or dairy families left at 9 pm because they had to be working by 5 am. The result was an erroneous community reaction

that dairy farmers neither mixed nor enjoyed a party, or didn't appreciate the welcome. Today the community revolves around the dairy farm routine. June is the time the population changes, social functions are dictated by farewells in May and welcomes in July.

Initially the majority of landowners took on 50-50 sharemilker arrangements. The downside of such arrangements were that the majority of these sharemilkers were in the district "*only to promote their own career paths*". At that time, while the population was increasing especially with regard to children, the community spirit suffered. Nevertheless in retrospect dairying has created a more stable and generally cohesive community long past any 'them and us' situations.

At a district level feelings between "*the have's and the have nots*" exists. Because of the impact of irrigation the Papakaio community falls into the 'have's' category. Historically the community had a reputation for getting what it wanted by fund raising and this tradition has continued. It is a strong and focussed community in spite of being called "*the Papakaio Knobs*" by other districts, and it proudly points to its large multi-facility centre, heated swimming pool and the new squash courts. There is an active play centre and Plunket, tennis club, golf course, and a garden club with more than 60 members some of whom travel out from Oamaru. There is a general sense of community well being. The ripple effect of economic multipliers assisted in the development of at least one of these facilities. In appreciation of the volume of irrigation installation work contractors, using large earthmoving equipment, voluntarily laid out the Papakaio golf course.

The strong social network based on the Papakaio School was not evident elsewhere. Complaints were frequent of "*nothing much happens here*" and reports of no community welcome for new arrivals arose where new arrivals were mainly onto dairy conversions in communities that are primarily sheep and beef farming.

While the community was obviously more affluent than before irrigation and had gained a comprehensive range of social and sporting facilities, as in many depopulated and financially deprived communities, the local church and Country Women's Institute had closed.

Social Problems

Social divisions existed initially with dairying, and although some may remain today they are not so distinct. They were most visible during the early '80's with the entrance of the first dairy families from the North Island. These first families were unable to comprehend the social division, the "*them and us*" attitude that existed in this pastoral and arable community. Initially they were hesitant about socialising in case they were ostracised. Dairy farming had not been a highly rated occupation.

Dairying can be isolating for a single sharemilker or a childless couple, and meeting the community can be difficult. Not only because sharemilkers are busy people probably milking a minimum of 500 cows, but also because of the social focus provided by the school. Joining sports clubs or farm discussion groups, that often have no women members, are means of accessing the community. Notwithstanding, for some couples it took two years to get to know people. They found that their friends tended to be other newcomers but they also noted that there are not a lot of young sharemilkers. Sharemilkers, by their own admission, could be "*cliquey*" but being away from their own families necessitated a mutual support network.

Maori

There is a long tradition of Maori occupation in the Waitaki Valley. Today the population is small. In 1996 - Maori were 4.7 per cent of the population of Waitaki Plains (cf. 14.5% for NZ). There is support from marae at Waihao and Oamaru.

Women and young people

Both members of the sharemilking couple generally work full time in the operation with many women being responsible for the herd records, the cash book, the GST returns and the accounts as well as stock work like calving and standby relief milking. Women who do not work full time on the farm have used their skills in the community returning to teaching, setting up small business enterprises (e.g. farm secretary, florist) and tourism based enterprises like historical home hosting.

Farm children seek both non-farm jobs and tertiary education in Christchurch and Dunedin. Oamaru was not seen as an attractive employment option. Oamaru, it was observed, appeared to have a high unemployment rate with many "*directionless young people*".

Dairy workers are mainly young men, "*some are good, some are 'ratbags'*". They work long hours and live independently, "*some cook, some don't*". They work without a weekend off from August to October and because they are young they "*burn the candle at both ends*". By November they have "*crashed*", some are ill.

The berry farmers noted that the majority of their young pickers are either from the "*professional class*" or are country children, because they "*possess a work ethic*". Families without a work history or ethic were reported as not staying with the job as the work is too demanding.

CONCLUSION

There have been major social and economic changes in the Waitaki Plains, with flow-on effects through to the communities that service them and process agricultural commodities such as meat and dairy products. These changes have been brought about by the development of water resources through irrigation and a consequent series of land use changes and associated waves of newcomers. As a result, the plains are now heavily dependent on commodity production of dairy products (compared to sheep and wool as previously). While largely protected from the vagaries of drought, this community still remains vulnerable to swings in the world dairy products market.

REFERENCES

- Brown Copeland & Co. Ltd (1991). The 1988/9 South Island drought and the assistance package provided by government. A report prepared for the Ministry of Agriculture and Fisheries.
- Fitzgerald, Kathleen and Taylor, Nick (1989). North Otago social assessment. Report for the North Otago Council of Social Services, Centre for Resource Management, Lincoln.
- Gillies, A. (1980). The effect of irrigation development and demographic change on rural social conditions (pp.21-37); in A.R. Taylor (Ed.), *Proceedings of the Second Irrigation Conference of the New Zealand Irrigation Association Inc.*, NZ Irrigation Association, Ashburton.
- Houghton, Ruth M. (1980). Lower Waitaki Communities study. Town and Country Planning Division, Ministry of Works & Development, Dunedin.
- Hubbard, L.J. and Brown, W.A.N. (1979). The regional impacts of irrigation development in the Lower Waitaki. Research Report No. 99, Agricultural Economics Research Unit, Lincoln.
- Morton, H.A. (1978). Environmental and social impacts of irrigation. In A.R. Taylor (Ed), *Proceedings of the Irrigation Conference held at Ashburton*, NZ Irrigation Association, Ashburton, pp 25-32.
- O'Neill, Ann (Ed.) (1979). Interstices. Studies in Rural Change, Rural Ministry Unit, Canterbury.
- Rowe, R.N. (1982). Looking towards the future. In A.R. Taylor (Ed), *Proceedings of the Irrigation Conference held at Rangiora*, NZ Irrigation Association, Ashburton, pp 111-115.
- Taylor, Nick (1990). NZ Rural Trust information retrieval project. Report to MAFTech South, Lincoln, Taylor Baines and Associates, Rangiora.